

ASTEROIDS AND METEORITES

The solar system has a large number of rocky and metallic objects that are in orbit around the Sun but are too small to be considered full-fledged planets. These objects are known as asteroids or minor planets. Most, but not all, are found in a band or belt between the orbits of Mars and Jupiter. Some have orbits that cross Earth's path, and there is evidence that Earth has been hit by asteroids in the past. One of the least eroded, best preserved examples of this is the Barringer Meteor Crater near Winslow, Arizona.

Asteroids are material left over from the formation of the solar system. One theory suggests that they are the remains of a planet that was destroyed in a massive collision long ago. More likely, asteroids are material that never coalesced into a planet. In fact, if the estimated total mass of all asteroids was gathered into a single object, the object would be only about 1,500 kilometers (932 miles) across - less than half the diameter of our Moon.

Thousands of asteroids have been identified from Earth. It is estimated that 100,000 are bright enough to eventually be photographed through Earth-based telescopes.

Much of our understanding about asteroids comes from examining pieces of

space debris that fall to the surface of Earth. Asteroids that are on a collision course with Earth are called meteoroids. When a meteoroid strikes our atmosphere at high velocity, friction causes this chunk of space matter to incinerate in a streak of light known as a meteor. If the meteoroid does not burn up completely, what's left strikes Earth's surface and is called a meteorite. One of the best places to look for meteorites is the ice cap of Antarctica.

Of all the meteorites examined, 92.8 percent are composed of silicate (stone), and 5.7 percent are composed of iron and nickel; the rest are a mixture of the three materials. Stony meteorites are the hardest to identify since they look very much like terrestrial rocks.

Since asteroids are material from the very early solar system, scientists are interested in their composition. Spacecraft that have flown through the asteroid belt have found that the belt is really quite empty and that asteroids are separated by very large distances.

Current and future missions will fly by selected asteroids for closer examination. The Galileo Orbiter, launched by NASA in October 1989, will investigate main-belt asteroids on its way to Jupiter. The Comet Rendezvous/Asteroid Flyby (CRAF) and Cassini missions were planned to study these far-flung objects. Scheduled for launch in the latter part of the 1990s, the CRAF and Cassini missions were a collaborative project of NASA, the European Space Agency and the federal space agencies of Germany and Italy, as well as the United States Air Force and the Department of Energy. One day, space factories will mine the asteroids for raw materials.

Source: NASA